

REMARKS

Applicants have considered the Final Office Action of January 24, 2008. Claims 1, 16 and 18-21 have been amended. Claim 34 has been cancelled. New claims 35-44 are added. Claims 1-33 and 35-44 will be pending upon entry. Reconsideration of the Application is requested.

Upon review, claim 26 has been amended to correct a typographical error. Support can be found in page 23, lines 21-24 of the specification.

Claims 1-3, 10-13 and 16-17 under 35 U.S.C. 103(a) were rejected as allegedly being unpatentable over Ayers (U.S. Patent No. 4,466,869) in view of O'Leary et al. (U.S. Patent No. 4,080,270).

Claims 4-7 & 14 were rejected under 103(a) as allegedly being unpatentable over Ayers, O'Leary, and Bender (U.S. Patent Publ. No. 2002/0033369).

Claims 8-9 & 15 were rejected under 103(a) as allegedly being unpatentable over Ayers, O'Leary, Bender, and Fujii (U.S. Patent Publ. No. 2002/0170815).

Applicants traverse the rejections together.

Claim 1 has been amended to provide further structure to the anode compartment. In particular, the light source now illuminates the photo-reactive surface through the anode, but not through the anolyte. Support for these amendments can be found in at least Fig. 2; page 6, lines 31-36; and pg. 13, line 1 to pg. 15, line 33.

One advantage of this structure is that the amount of light provided to the photo-reactive surface will not be affected by the composition of the anolyte. In contrast, Fig. 1 of Ayers shows the light must pass through the electrolyte before reaching catalytic layer 7. Ayers does not appear to describe in his specification any embodiments where (i) the photoelectrode and counterelectrode are separated or (ii) moving the electrodes against a wall of his cell. Applicants note that simply moving the middle structure of Ayers to a wall would prevent the photoelectrode 5 from contacting electrolyte, as is needed for the photo-reaction to occur. Thus, the claims are non-obvious.

Applicants have also added new independent claim 44, which specifies the connection of the structures in different words, but with the same result.

Applicants request withdrawal of these three § 103(a) rejections.

Claims 19-22, 28 and 32 were rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Ayers, Bender, O'Leary, and Bacskai (U.S. Patent No. 4,101,531). Applicants traverse the rejection.

Based on the Examiner's discussion in paragraphs 3 and 11 of the Office Action, Applicants understand that the Examiner is construing the discussion of removing carbon dioxide and hydrogen through conversion to C₆ hexose as an intended use. Applicants have amended independent claim 19 to require the presence of additional structures (O₂ gas separator, gas/liquid contactor, carbon source, liquid/solid separator) and specifying the connections between the specified structures. Support for this amendment can be found at least in Fig. 2; the specification from page 13, line 1 to page 14, line 5; and the specification from page 56, line 10 to page 57, line 17. In addition, please note that the specification shows several different carbon sources for absorbing carbon dioxide. See at least Fig. 2; pg. 7, lines 21-24; pg. 13, lines 27-32; pg. 28, lines 5-26; and Table 1 spanning pp. 31-54 of the specification. The newly added structures do not appear to be suggested by the cited references. As a result, the claims are not obvious.

New claims 35-38 recite additional aspects of claim 19. The subject matter of claims 35-37 are also found in the same locations as above. The anode and cathode of Ayers and O'Leary are not located on opposite surfaces or walls of the photolytic cell. Bender does not appear to disclose this subject matter. These are additional reasons for claims 35-37 to be allowed. The subject matter of claim 38 is present in original claim 3 and page 11, lines 13-15 of the specification.

Applicants request withdrawal of the § 103(a) rejection based on Ayers, Bender, O'Leary, and Bacskai.

Claim 18 was rejected under 103(a) as allegedly being unpatentable over Ayers, O'Leary, and Lundquist (U.S. Patent No. 6,436,294).

Claims 23-24, 26-27 and 29 were rejected under 103(a) as allegedly being unpatentable over Ayers, Bender, O'Leary, Bacskai, and Fujii.

Claim 25 was rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Ayers, Bender, O'Leary, Bacskai, and Lundquist.

Claims 30-31 were rejected under 103(a) as allegedly being unpatentable over Ayers, Bender, O'Leary, Bacskai, Fujii, and Lundquist.

Applicants traverse these four rejections together.

The rejected claims all ultimately depend from claim 19. If claim 1 is non-obvious (as argued above), then so are its dependent claims. MPEP § 2143.03; *In re Fine*. Bender, Bacskai, Fujii, and Lundquist do not appear to remedy the shortcomings of Ayers and O'Leary. Thus, these claims are still non-obvious.

Applicants request withdrawal of these four § 103(a) rejections.

New claims 39-43 recite additional aspects of claim 1. Support for claims 39 and 40 can be found on at least page 1, lines 16-26 and page 9, lines 12-20. Support for claims 41 and 42 can be found on at least from page 25, line 18 to page 26, line 2. Support for claim 43 can be found on at least page 13, lines 16-26.

CONCLUSION

For at least these reasons, the pending claims (1-33 and 35-44) are in condition for allowance. Withdrawal of the rejections and issuance of a Notice of Allowance is requested.


In the event the Examiner considers personal contact advantageous to the disposition of this case, he is hereby authorized to call Richard M. Klein, at telephone number 216-861-5582, Cleveland, OH.

Respectfully submitted,

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